Covered Source Permit Review Summary

Application File No.: Renewal Application No. 0097-06
Significant Modification No. 0097-07
Significant Modification No. 0097-08

Permit No.: 0097-01-C

Applicant: Kauai Island Utility Cooperative

Facility: Port Allen Generating Station
261 Akaula Street
UTM Coordinates: 2422.222 N 439.2516 E
Eleele, Kauai, Hawaii 96705

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Application Dates: Renewal application dated September 22, 2009 and additional information dated April 19, 2011, April 17, 2012 and May 25, 2012
Significant Modification application dated October 24, 2011 and additional information dated November 21, 2011
Significant Modification application dated December 15, 2011

Proposed Project:

The Standard Industrial Classification (SIC) Code is 4911 under *Electric Services*.

Renewal Application No. 0097-06
This application is for the renewal of Covered Source Permit (CSP) No. 0097-01-C, issued on September 23, 2005 and amended on December 10, 2008. A check for $3,000.00 was submitted by the applicant for a renewal of a covered source permit (PSD source) and processed.

The Kauai Island Utility Cooperative's (KIUC) Port Allen Electric Power Generating Station is situated on a 9.2 acre site on the south side of the island of Kauai, adjacent to Hanapepe Bay and the town of Port Allen. The facility elevation is approximately 12 meters (40 feet) above

mean sea level. The surrounding land is predominantly used for agricultural purposes. The topography within the immediate vicinity of the generating station is level and gradually slopes down to Hanapepe Bay. The terrain rises rapidly to the northeast towards Ahuaeliku Mountain, approximately 5.5 kilometers (3.4 miles) to an elevation of 1,222 meters (4,032 feet). The air quality within the area is classified as attainment or unclassifiable for all criteria pollutants. The location is designated as a PSD Class II area.

The Port Allen Generating Station is solely used to generate electric power for the island of Kauai. Power is generated by a mix of nine diesel engine generators, one steam boiler with steam turbine generator, two combustion gas turbines, and one unfired heat recovery steam generator.

The Port Allen Station operates its generating units under different modes of operation. Specifically, diesel engine generator D-9 is required to use an SCR for supplemental NO_x emission controls, and the combustion gas turbines may operate in either simple or combined cycle mode. During simple cycle operation the combustion gas is vented directly to the atmosphere without any heat recovery. This mode of operation enables the turbines to rapidly be brought on line to provide peaking or emergency power. Under base load or combined cycle operation the combustion gas from one of the gas turbines is exhausted through a heat recovery steam generator (HRSG). Only one of the gas turbines at a time can operate in combined cycle mode. The steam is used in the steam turbine to generate additional power. Because the HRSG requires time to be brought to full operating temperature, this mode of operation is not suitable for peak load conditions.

The power generating facility is permitted to operate twenty-four (24) hours per days, 365 days per year, for a total of 8,760 hours of operation per year. The facility operates on a demand basis following the required load which under normal operation does not require all units to be operating all of the time. Additionally, selected units will be down for required or emergency maintenance.

The requirements of 40 CFR Part 63, Subpart JJJJJJ – National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources, were also incorporated into the permit renewal.

<u>Significant Modification No. 0097-07</u>
KIUC is requesting approval to install oxidation catalyst systems and crankcase lubricating oil separators on the EMD diesel engine generators (Units D-1 through D-5) at the Port Allen Generating Station on the island of Kauai. The purpose of the installation of emission controls is to allow the EMDs to comply with the requirements of 40 CFR Part 63, Subpart ZZZZ, the Reciprocating Internal Combustion Engine (RICE) National Emission Standards for Hazardous Air Pollutants (NESHAP), which take effect on May 3, 2013. The installation of the oxidation catalysts will reduce emissions of carbon monoxide and hazardous air pollutants (HAPs) from these engines. The RICE NESHAP also requires additional control of fugitive emissions from the engine crankcases; the EMDs are equipped with crankcase lubricating oil separators to prevent lube oil mist from being emitted from the engine's crankcases and do not require additional controls to achieve compliance with this requirement. Effective May 3, 2013, KIUC must also implement several new monitoring, testing, recordkeeping and reporting practices for the EMD diesel engine generators as required under the RICE NESHAP.

The project will be a significant modification under the covered source regulations. The installation of emission controls in accordance with the requirements of the NESHAP will reduce emissions, and no other changes to the EMDs are being proposed, however, monitoring conditions will change which requires that this application is processed as a significant modification rather than a minor modification.

A check for $200.00 and $800.00 was submitted by the applicant for a significant modification of a covered source and processed.

Significant Modification No. 0097-08

KIUC is requesting approval to install oxidation catalyst systems and crankcase controls on the Stork-Wartsila Diesel (SWD) diesel engine generators (Units D-6 through D-9) at the Port Allen Generating Station on the island of Kauai. The purpose of the installation of emission controls is to allow the SWDs to comply with the requirements of 40 CFR Part 63, Subpart ZZZZ, the Reciprocating Internal Combustion Engine (RICE) National Emission Standards for Hazardous Air Pollutants (NESHAP), which take effect on May 3, 2013. The installation of the oxidation catalysts will reduce emissions of carbon monoxide and hazardous air pollutants (HAPs) from these engines. The RICE NESHAP also requires additional control of fugitive emissions from the engine crankcases; KIUC will comply with this requirement by installing crankcase controls. Effective May 3, 2013, KIUC must also implement several new monitoring, testing, recordkeeping and reporting practices for the SWD diesel engine generators as required under the RICE NESHAP.

The project will be a significant modification under the covered source regulations. The installation of emission controls in accordance with the requirements of the NESHAP will reduce emissions, and no other changes to the SWDs are being proposed, however, monitoring conditions will change which requires that this application is processed as a significant modification rather than a minor modification.

A check for $1,000.00 was submitted by the applicant for a significant modification of a covered source and processed.

Equipment Description:

1. Power Generating Equipment
   The power generating equipment for the facility are presented in the table below.

Table 1

Unit Number	Manufacturer	Model/ Serial Number	Rated Capacity		
			MW	MMBtu/hr	gal/hr
D-1, D-2	GM EMD Diesel Generator	16-567-D4/ 64-B-10, 64-B-39	1.8 each	19.3 each	140 each
D-3, D-4, D-5	GM EMD Diesel Generator	16-645-E4/ 72-D1-1018, 74-G3-1523, 73-C3-1114	2.5 each	27.2 each	198 each
D-6 through D-9	Stork-Wartsila Diesel Generator	6TM620/ 60600, 60700, 60800, 60900	7.86 each	69.5 each	505 each
S-1	Combustion Engineering Steam Boiler/Turbine	20810/ 20810	10	156.3	1135
GT-1	Hitachi/GE Combustion Gas Turbine	PG 5251 M/ Turbine No. 214354	18.1 (SC) 17.5 (CC) (GT only)	259.8 (SC) 236.8 (CC)	1882 (SC) 1722 (CC)
GT-2	John Brown Combustion Gas Turbine	PG 5341/ Turbine No. 244424	22.8 (SC) 22.1 (CC) (GT only)	303.3 (SC) 291.4 (CC)	2206 (SC) 2119 (CC)

Note: SC - simple cycle operation
CC - combined cycle operation
All equipment calculated using fuel oil no. 2, HHV of 137,500 Btu/gal

The large diesel engine generators (D-6 through D-9) are used for baseload generation, along with the steam boiler and steam turbine generator. The small diesels (D-1 through D-5) and the combustion gas turbines in simple cycle are used for peaking loads. The combustion gas turbines may also be used in combined cycle mode with heat recovery for intermediate load operations. Under normal conditions, unit GT-2 operates in a combined cycle mode approximately sixteen (16) hours per day, with GT-1 serving as a backup to GT-2.

2. Fuel Storage Tanks
The fuel storage tanks at the facility are listed in the table below.

Table 2

Tank Number	Tank Contents	Capacity (gallons)	Configuration
Diesel Storage Tank A	Diesel or fuel oil no. 2	42,635	Vertical
Diesel Storage Tank B	Diesel or fuel oil no. 2	39,226	Vertical
Fuel Oil No. 6 Day Tank	Spec Used Oil or fuel oil no. 2	11,424	Vertical
Clean Lube Oil Tank	Clean Lube Oil	19,992	Vertical
EMD Lube Oil Tank A	EMD Lube Oil	3,024	Horizontal
EMD Lube Oil Tank B	EMD Lube Oil	3,990	Horizontal
SWD Used Oil Tank	Specification Used Oil	8,022	Vertical
Oil Sludge Tank	Oil Sludge	3,024	Vertical
C/E Waste Oil Day Tank	Specification Used Oil	2,000	Rectangular Cross Section

Air Pollution Controls:

1. Diesel engine generators D-6 through D-8 are equipped with Variable Fuel Injection Timing Retard (FITR).
2. Diesel engine generator D-9 is equipped with a Selective Catalytic Reduction (SCR) System as part of a NO_x control technology demonstration project. This project was deemed successful and shows the *technical* feasibility of a SCR system. The economic feasibility was not shown, however.
3. Low sulfur fuel (0.4%) fuel oil no. 2 and/or biodiesel is used for diesel engine generators D-1 through D-9.
4. Low sulfur fuel (0.4%) fuel oil no. 2, naphtha and/or biodiesel is used for combustion gas turbine GT-1 and GT-2.
5. The steam boiler S-1 is equipped with low-NO_x burners.
6. Low sulfur fuel (0.4%) fuel oil no. 2 and/or biodiesel is used for steam boiler S-1.
7. Diesel engine generators D-1 thru D-5 are equipped with Miratech V-Cat oxidation catalyst systems and EMD lube oil separators and will utilize ultra-low sulfur (0.0015%) fuel oil to comply with 40 CFR Part 63, Subpart ZZZZ, effective May 3, 2013.
8. Diesel engine generators D-6 thru D-9 are equipped with oxidation catalyst systems and crankcase controls to comply with 40 CFR Part 63, Subpart ZZZZ, effective May 3, 2013.

Insignificant Activities:

Table 3

Tank Number	Tank Contents	Capacity (gallons)	Justification
Diesel Storage Tank A	Diesel or fuel oil no. 2	42,635	HAR 11-60.1-82(f)(7)
Diesel Storage Tank B	Diesel or fuel oil no. 2	39,226	HAR 11-60.1-82(f)(1)
Fuel Oil No. 6 Day Tank	Spec Used Oil or no. 2	11,424	HAR 11-60.1-82(f)(1)
Clean Lube Oil Tank	Clean Lube Oil	19,992	HAR 11-60.1-82(f)(1)
EMD Lube Oil Tank A	EMD Lube Oil	3,024	HAR 11-60.1-82(f)(1)
EMD Lube Oil Tank B	EMD Lube Oil	3,990	HAR 11-60.1-82(f)(1)
SWD Used Oil Tank	Specification Used Oil	8,022	HAR 11-60.1-82(f)(1)
Oil Sludge Tank	Oil Sludge	3,024	HAR 11-60.1-82(f)(1)
C/E Waste Oil Day Tank	Specification Used Oil	2,000	HAR 11-60.1-82(f)(1)
Degreasing Tank	Petroleum Solvents	30	HAR 11-60.1-82(f)(1)
Emergency and Black Start Diesel Engines			
398 bhp Caterpillar C9 ACERT emergency diesel engine generator			
300 hp Cummins V8 (starting engine for GT-1)			
475 hp EMD (starting engine for GT-2)			

Fuels:

The diesel engine generators (D-1 through D-9) and combustion gas turbines (GT-1 and GT-2) operate exclusively on fuel oil no. 2. The steam boiler S-1 primarily operates on fuel oil no. 2 and also has the capability and is permitted to burn specification (spec) used oil and transformer specification used oil when blended with fuel oil no. 2. Also, the use of alternate backup fuels such as naphtha and biodiesel in the combustion gas turbines (GT-1 and GT-2) and biodiesel in the diesel engine generators (D-1 through D-9) and steam boiler (S-1) is allowed.

Table 4

Fuel Oil No. 2 or Diesel No. 2	
Sulfur, wt. %	0.4% max (to 5/2/13) 0.0015% max (as of 5/3/13, D-1 through D-5 only)
Heating value, Btu/gal	137,000 19,700 Btu/lb
Viscosity @ 40EC, CST	3.5
Gravity, API	37
Flash point, °F	140 min
Ash, wt. %	0.01 max
Specification Used Oil	
Heat content, Btu/gal (typical)	140,000
Sulfur, wt. %	0.5 max
Arsenic, ppm	5 max
Cadmium, ppm	2 max
Chromium, ppm	10 max
Lead	50 max
Total Halogens, ppm	1000 max
PCBs, ppm	2 max
Gravity, API	20-30
Flash point, EF	>100
Naphtha	
Reid vapor pressure, psia	6.4 max

Sulfur, wt. %	0.01 max
Heating value, Btu/gal	115,000
Gravity, API	63.3 to 65.5
Final boiling point, °C	179 max
Biodiesel	
Sulfur, wt. %	0.4% max (to 5/2/13) 0.0015% max (as of 5/3/13, D-1 through D-5 only)
Heating value, Btu/gal	119,200
Cetane no.	55
Nitrogen, ppm	18
Aromatics, vol %	0
Specific gravity	0.88
Ash, wt/ %	none

Stack Parameters:

Table 5

Unit Number	Stack Height (m)	Exit Diameter (m)	Exit Velocity (m/s)	Exit Temperature (K)
D-1, D-2 (each)				
no stack extensions	12.19	0.56	30.55	677.0
with stack extensions	15.24	0.56	30.55	677.0
D-3, D-4, D-5 (each)	12.19	0.56	41.38	677.0
D-6, D-7, D-8 (each)				
50% load	28.96	1.11	16.76	637.4
75% load	28.96	1.11	23.41	621.9
90% load	28.96	1.11	28.26	621.9
100% load	28.96	1.11	34.02	635.8
D-9				
50% load	28.96	1.11	16.76	637.4
75% load	28.96	1.11	23.41	621.9
90% load	28.96	1.11	28.26	621.9
100% load	28.96	1.11	34.02	635.8
S-1				
no stack extension	22.25	2.5	6.9	451.3
GT-1	12.50 (SC) 16.76 (CC)	2.13 (SC) 3.14 (CC)	52.50 (SC) 18.39 (CC)	783.0 (SC) 519.1 (CC)
GT-2	10.67 (SC) 16.76 (CC)	2.44 (SC) 3.14 (CC)	56.50 (SC) 21.28 (CC)	788.6 (SC) 505.2 (CC)
Notes: SC- Simple cycle operation CC – Combined cycle operation				

Alternate Operating Scenarios:

No alternate operating scenarios were identified in the application.

Applicable Requirements:

Hawaii Administrative Rules (HAR)

Title 11, Chapter 59 Ambient Air Quality Standards
Title 11, Chapter 60.1 Air Pollution Control
Subchapter 1 General Requirements
Subchapter 2 General Prohibitions
HAR 11-60.1-31 Applicability
HAR 11-60.1-32 Visible Emissions

HAR 11-60.1-38	Sulfur Dioxides from Fuel Combustion
HAR 11-60.1-39	Storage of Volatile Organic Compounds
Subchapter 5	Covered Sources
Subchapter 6	Fees for Covered Sources, Noncovered Sources, and Agricultural Burning
HAR 11-60.1-111	Definitions
HAR 11-60.1-112	General Fee Provisions for Covered Sources
HAR 11-60.1-113	Application Fees for Covered Sources
HAR 11-60.1-114	Annual Fees for Covered Sources
Subchapter 9	Hazardous Air Pollution Sources

Federal Requirements

40 CFR Part 63 - National Emission Standards for Hazardous Air Pollutants for Source Categories (Maximum Achievable Control Technologies (MACT) Standards)

Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. (RICE NESHAP) - applicable to stationary RICE located at major or area sources of HAP emissions. This site is an area source of HAP emissions.

Subpart JJJJJJ – National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources.

Non-applicable Requirements:

Hawaii Administrative Rules (HAR)

Title 11, Chapter 60.1	Air Pollution Control
Subchapter 7	Prevention of Significant Deterioration
Subchapter 8	Standards of Performance for New Stationary Sources (NSPS)

Federal Requirements

40 CFR Part 60 - Standards of Performance for New Stationary Sources (NSPS)

Subpart GG - Standards of Performance for Stationary Gas Turbines, is applicable to stationary gas turbines with a heat input at peak load equal to or greater than 10.7 gigajoules per hour, constructed, modified or reconstructed after 10/3/77. The gas turbines, units GT-1 and GT-2, were built before 10/3/77, and did not undergo modification or reconstruction after 10/3/77. They did, however, receive “New Technology” upgrades in 1988 and 1989 (see Sierra Research’s letters of 10/15/96 and 8/15/97) that had the potential to trigger a modification under 40 CFR Part 60 (NSPS) and a major modification under 40 CFR Part 52.21 (PSD). These “New Technology” upgrades to GT-1 and GT-2 were latter concurred by EPA’s Region IX (Bob Baker) *not* to be a modification under NSPS nor a major modification under PSD.

40 CFR Part 61 - National Emission Standards for Hazardous Air Pollutants (NESHAP)

Prevention of Significant Deterioration (PSD):

PSD is not applicable because this facility is not a *new* major stationary source nor does this application propose any *major modifications* to a major stationary source as defined in 40 CFR 52.21. A *major modification* is defined as a project at an existing major source that will result in a significant and a significant net emissions increase above specified emission thresholds for pollutants subject to regulation.

Significant Modification No. 0097-07

Table 6 - Emissions Increase Due to Installation of Oxidation Catalyst Systems – D-1 to D-5

	NO_x (tpy)	SO_2 (tpy)	CO (tpy)	VOC (tpy)	$PM_{10}/PM_{2.5}$ (tpy)	GHG (tpy)
Baseline Actual Emissions	257.9	2.9	68.5	6.6	4.3	13,344
Projected Actual Emissions	1522.2	0.7	121.3	39.0	23.6	78,015
Demand Growth Exclusion	1264.3	N/A	52.8	32.4	19.3	64,671
Emission Increase	0	(2.2)	0	0	0	0
PSD Thresholds	40	40	100	40	15/10	75,000
Exceeds?	No	No	No	No	No	No

Significant Modification No. 0097-08

Table 7 - Emissions Increase Due to Installation of Oxidation Catalyst Systems – D-6 to D-9

	NO_x (tpy)	SO_2 (tpy)	CO (tpy)	VOC (tpy)	$PM_{10}/PM_{2.5}$ (tpy)	GHG (tpy)
Baseline Actual Emissions	1,248.0	150.1	252.1	75.8	83.8	127,072
Projected Actual Emissions	3,320.6	704.0	185.8	484.1	162.3	242,035
Demand Growth Exclusion	2,072.6	553.9	N/A	408.3	78.5	114,963
Emission Increase	0	0	(66.3)	0	0	0
PSD Thresholds	40	40	100	40	15/10	75,000
Exceeds?	No	No	No	No	No	No

Best Available Control Technology (BACT):

A Best Available Control Technology (BACT) analysis is required for new or modified sources that have the potential to emit or increase emissions above significant amounts as defined in HAR 11-60.1. Since this is not a new source nor are any modifications proposed that have the potential to cause a significant net increase in air emissions, a BACT analysis is not required.

Major Source/Synthetic Minor Source Applicability:

This facility is classified as a major source.

Consolidated Emissions Reporting Rule (CERR):

40 CFR Part 51, Subpart A - Emission Inventory Reporting Requirements, determines CER based on the emissions of criteria air pollutants from Type A or Type B point sources (as defined in 40 CFR Part 51, Subpart A), that emit at the CER triggering levels as shown in the table below.

Table 8

Pollutant	Type A CER Triggering Levels [1] (tpy)	Type B CER Triggering Levels [1] (tpy)	Pollutant	In-house Total Facility Triggering Levels [2] (tpy)	Total Facility Emissions (tpy)
NO_x	≥2500	≥100	NO_x	≥25	6683.7
SO_2	≥2500	≥100	SO_2	≥25	1874.2
CO	≥2500	≥1000	CO	≥250	370.6
$PM_{10}/PM_{2.5}$	≥250/≥2500	≥100/100	PM/PM_{10}	≥25/25	PM = 203.6 PM_{10} = 203.6 $PM_{2.5}$ = 203.6
VOC	≥250	≥100	VOC	≥25	447.2
			HAPS	≥5	18.67

[1] Based on actual emissions
[2] Based on potential emissions

This facility emits at the CER triggering levels. Therefore, CER requirements are applicable.

The Clean Air Branch also requests annual emissions reporting from those facilities that have facility-wide emissions of a single air pollutant exceeding in-house triggering levels. Since the in-house triggering levels are exceeded, annual emissions reporting for the facility will be required for in-house recordkeeping purposes.

Compliance Assurance Monitoring (CAM):

40 CFR Part 64

Applicability of the CAM rule is determined on a pollutant specific basis for each affected emission unit. Each determination is based upon a series of evaluation criteria. In order for a source to be subject to CAM, each source must:

- Be located at a major source per Title V of the Clean Air Act Amendments of 1990;
- Be subject to federally enforceable applicable requirements;
- Have pre-control device potential emissions that exceed applicable major source thresholds;
- Be fitted with an “active” air pollution control device; and
- Not be subject to certain regulations that specifically exempt it from CAM.

Emission units are any part or activity of a stationary source that emits or has the potential to emit any air pollutant. Compliance Assurance Monitoring (CAM) is currently applicable to some of the emission units covered by this permit renewal and by the significant modifications. Units D-6 through D-9 use add-on controls (FITR systems on Units D-6 through D-8 and the SCR

system on Unit D-9) for the control of NO_x emissions, and thus are subject to CAM requirements. The covered source permit requires KIUC to continuously monitor NO_x emissions from Units D-6 through D-9. Thus compliance with the CAM requirements for NO_x control is achieved through the use of NO_x CEMs on Units D-6 through D-9.

CAM requirements will also apply to Units D-1 through D-5, as well as to D-6 through D-9, because those units use oxidation catalysts to control CO emissions. The significant modification to the covered source permit requires KIUC to use a CPMS (continuous parameter monitoring system) to continuously monitor and record temperature at the oxidation catalyst inlet (as a parameter for CO emissions) for Units D-1 through D-9.

Synthetic Minor Source:

Not applicable, this facility is a major source.

Project Emissions:

Maximum hourly emission rates for steam boiler S-1, diesel engine generators D-1 through D-5, and combustion gas turbines GT-1 and GT-2 are calculated from the maximum hourly heat input or fuel rates shown in Table 9 and the emission factors shown in Table 10. Table 11 shows the maximum hourly emission rates in lbs/hr from multiplying the maximum hourly heat input or fuel rates by the emission factors. Maximum annual emission rates for steam boiler S-1, diesel engine generators D-1 and D-2, diesel engine generators D-3 through D-5, and combustion gas turbines GT-1 and GT-2, are calculated as 8760 hours per year times the maximum hourly emission rates, as there are no operating restrictions for these units. Maximum hourly emission rates for diesel engine generators D-6 through D-9 are taken from the limits in Covered Source Permit No. 0097-01-C. Maximum annual emissions for criteria pollutants and hazardous air pollutants are shown in Table 12 and Table 13, respectively. Since naphtha has the same emission factors for NO_x, CO, PM/PM_{10} and VOC as fuel no. 2 and lower emission factors for SO_2 as fuel oil no. 2, the emissions for gas turbines GT-1 and GT-2 using naphtha are not shown.

Table 9 – Maximum Hourly Fuel and Heat Input Rates

Equipment	Load (kW)	Heat Rate (Btu/kWh)	Fuel	Fuel HHV (Btu/gal)	Maximum Hourly Fuel Rate (gal/hr)	Maximum Hourly Heat Input Rate (MMBtu/hr)
S-1	10,000	15,627	Fuel oil no. 2 and/or spec used oil	137,500	1,136	156.3
D-1, D-2	1,800 each	10,717	Fuel oil no. 2	137,500	140 each	19.3 each
D-3, D-4, D-5	2,500 each	10,882	Fuel oil no. 2	137,500	198 each	27.2 each
D-6, D-7, D-8, and D-9	7,860 each	8,834	Fuel oil no. 2	137,500	505 each	69.5 each
GT-1 (simple cycle)	18,100 (GT only)	14,300	Fuel oil no. 2	137,500	1,882	258.8
GT-1 (combined cycle)	17,540 (GT only)	13,500	Fuel oil no. 2	137,500	1,772	256.8
GT-2 (simple cycle)	22,845 (GT only)	13,280	Fuel oil no. 2	137,500	2,206	303.3
GT-2 (combined cycle)	22,110 (GT only)	13,180	Fuel oil no. 2	137,500	2,119	291.4

Table 10 - Emission Factors

Equipment	NO_x	SO_2	CO	VOC	$PM/PM_{10}/PM_{2.5}$	Post-Project SO_2	Post-Project CO
S-1 (spec used oil)	19.2 [1,3,5]	71.0 [1,4,5]	5 [1,5]	0.76 [1,5]	2.3 [1,5]		
S-1 (fuel oil no. 2)	19.2 [1,3,6]	56.8 [1,4,6]	5 [1,6]	0.76 [1,6]	2.3 [1,6]		
D-1, D-2, D-3, D-4, D-5	3.2 [2,7]	0.407 [2,4,7]	0.85 [2,7]	0.0819 [2,7]	0.0496 [2,7]	1.53E-03 [2,10]	0.255 [2,11]
D-6, D-7, D-8	2.67 [2,9]	0.477 [2,4,7]	0.344 [2,9]	0.328 [2,9]	0.11 [2,9]		0.1032 [2,12]
D-9	0.99 [2,9]	0.477 [2,4,7]	0.647 [2,9]	0.328 [2,9]	0.11 [2,9]		0.1941 [2,12]
GT-1, GT-2	0.88 [2,8]	0.407 [2,4,8]	3.30E-03 [2,8]	4.10E-04 [2,8]	1.15E-02 [2,8]		

[1] lb/1000 gal
[2] lb/MMBtu
[3] NO_x emission factors for boiler S-1 adjusted to reflect 20% control for low-NO_x burners
[4] SO_2 emissions from stoichiometric calculations based on maximum allowable sulfur content of fuel (0.5 wt% for spec used oil and 0.4 wt % for fuel oil no. 2) and fuel densities and heat contents (8.1 lb/gal and 146,000 Btu/gal for spec used oil; 6.96 lb/gal and 137,500 Btu/gal for fuel oil no. 2)
[5] Based on AP-42, 5/10 (Table 1.3-1, 1.3-3: Utility Boilers, Distillate Oil), S=0.5%
[6] Based on AP-42, 5/10 (Table 1.3-1, 1.3-3: Utility Boilers, Distillate Oil), S=0.4%
[7] Based on AP-42, 10/96 (Table 3.4-1, 3.4-2: Large Stationary Diesel Engines), S=0.4%
[8] Based on AP-42, 4/00 (Table 3.1-1, 3.1-2a: Stationary Gas Turbines), S=0.4%
[9] NO_x, CO, VOC and PM_{10} emission factors back-calculated from lb/hr limits in CSP No. 0097-01-C
[10] Post-project SO_2 based on 0.0015% fuel sulfur
[11] Post-project CO based on 70% reduction from AP-42 emission factor
[12] Post-project CO based on 70% reduction from prior permit limit

Table 11 - Maximum Emission Rates - Criteria Air Pollutants (lbs/hr)

Equipment	NO_x	SO_2	CO	VOC	$PM/PM_{10}/PM_{2.5}$	Post-Project SO_2	Post-Project CO
S-1 [1]	21.8	65.8	5.7	0.9	2.6		
D-1	61.7	7.9	16.4	1.6	1.0	0.029 [4]	4.9 [5]
D-2	61.7	7.9	16.4	1.6	1.0	0.029 [4]	4.9 [5]
D-3	87.1	11.1	23.1	2.2	1.4	0.042 [4]	6.9 [5]
D-4	87.1	11.1	23.1	2.2	1.4	0.042 [4]	6.9 [5]
D-5	87.1	11.1	23.1	2.2	1.4	0.042 [4]	6.9 [5]
D-6	185.22	33.14	23.9	22.8	7.85		7.2 [6]
D-7	185.22	33.14	23.9	22.8	7.85		7.2 [6]
D-8	185.22	33.14	23.9	22.8	7.85		7.2 [6]
D-9	68.28	33.14	45.0	22.8	7.85		13.5 [6]
GT-1 [2]	228.6	105.8	0.9	0.1	3.0		
GT-2 [3]	256.4	118.7	1.0	0.1	3.4		

[1] Fuel oil no. 2 plus spec used oil
[2] Simple cycle
[3] Combined cycle
[4] Post-project SO_2 based on 0.0015% fuel sulfur
[5] Post-project CO based on 70% reduction from AP-42 emission factor
[6] Post-project CO based on 70% reduction from prior permit limit

Table 12 - Maximum Annual Emissions - Criteria Air Pollutants (tons/yr)

Equipment	NO_x	SO_2	CO	VOC	$PM/PM_{10}/PM_{2.5}$	Post-Project SO_2	Post-Project CO
S-1 [1]	95.6	288.1	24.9	3.8	11.5		
D-1 and D-2 (total)	378.5	48.1	100.5	9.7	5.9	0.18 [4]	30.2 [5]
D-3	381.3	48.5	101.3	9.8	5.9	0.18 [4]	30.4 [5]
D-4	381.3	48.5	101.3	9.8	5.9	0.18 [4]	30.4 [5]
D-5	381.3	48.5	101.3	9.8	5.9	0.18 [4]	30.4 [5]
D-6	985.1	176.0	126.9	121.0	40.6		38.1 [5]
D-7	985.1	176.0	126.9	121.0	40.6		38.1 [5]
D-8	985.1	176.0	126.9	121.0	40.6		38.1 [5]
D-9	365.3	176.0	238.7	121.0	40.6		71.6 [5]
GT-1 [2]	1001.4	463.4	3.8	0.5	13.1		
GT-2 [3]	1123.2	519.8	4.2	0.5	14.7		
Total	6683.7	2087.6	991.7	447.2	203.6	1874.2 [4]	370.6 [5]

[1] Fuel oil no. 2 plus spec used oil
[2] Simple cycle. Since there is only one HRSG and steam turbine, only one unit can operate in combined cycle at a time. Combination of GT-1 in simple cycle and GT-2 in combined cycle produces maximum annual emissions
[3] Combined cycle. Since there is only one HRSG and steam turbine, only one unit can operate in combined cycle at a time. Combination of GT-1 in simple cycle and GT-2 in combined cycle produces maximum annual emissions
[4] Post-project SO_2 based on 0.0015% fuel sulfur
[5] Post-project CO based on 70% reduction from AP-42 emission factor

Table 13 - Maximum Annual Emissions - Hazardous Air Pollutant (tons/yr)

Pollutant	S-1	GT-1	GT-2	D-1/D-2	D-3	D-4	D-5	D-6	D-7	D-8	D-9	Totals
Acetaldehyde		0.0287	0.0335	0.00246	0.0030	0.0030	0.0030	0.0077	0.0077	0.0077	0.0077	0.1045
Acrolein		0.0090	0.0105	0.00077	0.0009	0.0009	0.0009	0.0024	0.0024	0.0024	0.0024	0.0326
Benzene	0.0001	1.0075	1.1923	0.08778	0.1070	0.1070	0.1070	0.2729	0.2729	0.2729	0.2729	3.7003
Formaldehyde	0.2773	0.5360	0.6257	0.04607	0.0561	0.0561	0.0561	0.1434	0.1434	0.1434	0.1434	2.2270
Naphthalene		0.1479	0.1727	0.01271	0.0155	0.0155	0.0155	0.0396	0.0396	0.0396	0.0396	0.5382
Phosphorus		0.3414	0.3985	0.02934	0.0357	0.0357	0.0357	0.0913	0.0913	0.0913	0.0913	1.2415
Polychlorinated biphenyls	0.0311											0.0311
Toluene		0.3198	0.3733	0.02748	0.0335	0.0335	0.0335	0.0855	0.0855	0.0855	0.0855	1.1631
Xylene (mixed isomers)		0.2196	0.2564	0.01888	0.0230	0.0230	0.0230	0.0588	0.0588	0.0588	0.0588	0.7991
Antimony compounds		0.0250	0.0292	0.00215	0.0026	0.0026	0.0026	0.0067	0.0067	0.0067	0.0067	0.0910
Arsenic compounds	0.0031	0.0056	0.0065	0.00048	0.0006	0.0006	0.0006	0.0015	0.0015	0.0015	0.0015	0.0235
Beryllium compounds		0.0002	0.0002	0.00001	0	0	0	0	0	0	0	0.0004

Cadmium compounds	0.0012	0.0048	0.0056	0.00041	0.0005	0.0005	0.0005	0.0013	0.0013	0.0013	0.0013	0.0187
Chromium compounds	0.0062	0.0535	0.0624	0.00460	0.0056	0.0056	0.0056	0.0143	0.0143	0.0143	0.0143	0.2007
Cobalt compounds		0.0104	0.0121	0.00089	0.0011	0.0011	0.0011	0.0028	0.0028	0.0028	0.0028	0.0379
Lead compounds	0.0621	0.0647	0.0759	0.00558	0.0068	0.0068	0.0068	0.0174	0.0174	0.0174	0.0174	0.2983
Manganese compounds	0.0178	0.3869	0.4517	0.03325	0.0405	0.0405	0.0405	0.1035	0.1035	0.1035	0.1035	1.4252
Mercury compounds	0.0000	0.0006	0.0007	0.00005	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0025
Nickel compounds	0.8626	1.3655	1.5941	0.11737	0.1430	0.1430	0.1430	0.3653	0.3653	0.3653	0.3653	5.8298
Polycyclic organic matter	0.0006	0.2412	0.2816	0.02073	0.0253	0.0253	0.0253	0.0645	0.0645	0.0645	0.0645	0.8780
Selenium compounds	0.0032	0.0060	0.0070	0.00052	0.0006	0.0006	0.0006	0.0016	0.0016	0.0016	0.0016	0.0249
Total												18.67

Note
Emissions of PCDD/PCDF can be considered non-detectable in steam boiler S-1.

Table 14 – Greenhouse Gas Emissions

Equipment	CO_2 (MT)	CH_4 (MT)	N_2O (MT)	CO_2e (MT)	CO_2e (tons)
S-1	101,271	4.1	0.8	101,612	112,281
GT-1, Simple Cycle	168,322	6.83	1.37		
GT-2, Combined Cycle	188,795	7.66	1.53		
Total, Both Engines [1]	357,117	14.49	2.90	358,319	395,943
D-1 and D-2, Total, Both Engines	17,497	0.71	0.142		
D-3, D-4, and D-5 Each	17,626	0.715	0.143		
Total, All Engines	70,375	2.85	0.57	70,612	78,026
D-6, D-7, D-8, and D-9, Total	218,302	8.855	1.771	219,036	242,035

[1] Since there is only one HRSG and steam turbine, only one unit can operate in combined cycle at a time. Combination of GT-1 in simple cycle and GT-2 in combined cycle produces maximum annual emissions

Table 15 - Emission Factors – Greenhouse Gases

	CO_2	CH_4	N_2O
Distillate No. 2 (kg/MMBtu)	73.96 [1]	3.0E-03 [1]	6.0E-04 [1]
Used Oil (kg/MMBtu)	74 [1]	3.0E-03 [1]	6.0E-04 [1]
CO_2e GWP	1 [2]	21 [2]	310 [2]

[1] Tables C-1 and C-2 to Subpart C of 40 CFR Part 98
[2] Global warming potential (GWP) from Table A-1 to Subpart A of 40 CFR Part 98

Significant Modification No. 0097-07

Table 16

Potential to Emit for the EMD Engines (D-1 to D-5) Before and After Installation of the Oxidation Catalyst Systems				
Pollutant	**Potential to Emit Existing (lb/hr)**	**Potential to Emit With Ox Cat (lb/hr)**	**Potential to Emit Existing (tons/yr)**	**Potential to Emit With Ox Cat (tons/yr)**
NO_x	384.6	384.6	1,684	1,684
SO_2	48.9	0.2	214	0.7
CO	102.2	30.7	447	121
VOC	9.8	9.8	43	43
$PM_{10}/PM_{2.5}$	6.0	6.0	26	26
GHG	-	-	78,015	78,015

Significant Modification No. 0097-08

Table 17

Potential to Emit for the SWD Engines (D-6 to D-9) Before and After Installation of the Oxidation Catalyst Systems				
Pollutant	**Potential to Emit Existing (lb/hr)**	**Potential to Emit With Ox Cat (lb/hr)**	**Potential to Emit Existing (tons/yr)**	**Potential to Emit With Ox Cat (tons/yr)**
NO_x	623.9	623.9	2,734	2,734
SO_2	132.6	132.6	581	581
CO	116.7	35.0	511	185.8
VOC	91.2	91.2	399	399
$PM_{10}/PM_{2.5}$	116.7	116.7	138	138
GHG	-	-	242,035	242,035

Ambient Air Quality Impact Analysis:

Renewal Application No. 0097-06
An Ambient Air Quality Impact Analysis (AAQIA) is not required for existing facilities with no proposed modifications. Therefore, the facility emissions should have air quality impacts which are below the applicable State and Federal Ambient Air Quality Standards.

Significant Modifications Nos. 0097-07 and 0097-08
These applications incorporate by reference the ambient air quality analysis that was submitted for the initial covered source permit application. The proposed projects consist only of installing emission control technology as required under federal regulations. No increases in emissions or changes in operational parameters will result from the proposed control equipment retrofits, consequently, the previous ambient air quality modeling analysis is still conservatively representative of plant impacts.

Significant Permit Conditions and Discussion:

There are no changes to the existing permit conditions except for as follows:

Renewal Application No. 0097-06
Steam Boiler (Unit S-1) incorporated the requirements of 40 CFR Part 63, Subpart JJJJJJ, the Boiler MACT for area sources.

Significant Modification No. 0097-07
Diesel engine generators (Units D-1 through D-5) incorporated the requirements of 40 CFR Part 63, Subpart ZZZZ, the RICE NESHAP, which takes effect on May 3, 2013.

Significant Modification No. 0097-08
Diesel engine generators (Units D-6 through D-9) incorporated the requirements of 40 CFR Part 63, Subpart ZZZZ, the RICE NESHAP, which take effect on May 3, 2013.

Conclusion:

Recommend renewing Covered Source Permit No. 0097-01-C, which would supersede Covered Source Permit No. 0097-01-C, issued on September 23, 2005 and amended on December 10, 2008. The permit would incorporate the significant permit conditions listed above and be subject to a thirty-day (30-day) public comment period and forty-five-day (45-day) EPA review period.

Reviewer: Darin Lum
Date: 9/2012